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The Real Time Streaming Protocol (RTSP) and Session Description Protocol(SDP) Static Dictionary for Signaling Compression (SigComp)

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Abstract

The Real Time Streaming Protocol (RTSP) is a text-based protocol for controlling the delivery of real-time data. The protocol can be compressed by using Signaling Compression (SigComp). Similarly, the Session Description Protocol (SDP) is a text-based protocol intended for describing multimedia sessions for the purposes of session announcement, session invitation, and other forms of multimedia session initiation. This memo defines the RTSP/SDP-specific static dictionary that SigComp may use in order to achieve higher efficiency. The dictionary is compression algorithm independent.

The document provides a new static dictionary for RTSP and SDP. The dictionary is to be used in conjunction with RTSP, SDP and SigComp.

The static RTSP/SDP dictionary constitutes a SigComp state that can be referenced in the first RTSP message that the compressor sends out.

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1. Introduction

RTSP is used in conjunction with other protocols for implementing packet streaming services in mobile applications. These include streaming of news at low bitrates using still images and speech, music listening at various bitrates and qualities, video clips and watching live sports events.

This draft proposes the use of SIGCOMP solution for RTSP to conserve bandwidth and improve responsiveness of streaming applications. It describes an RTSP/SDP dictionary (similar to SIP/SDP dictionary in RFC 3485) to compress the RTSP messages on the low bandwidth high latency mobile links.

2. Design considerations

The document follows the same design approach as RFC 3485, which describes the static dictionary for SIP/SDP. This is because both RTSP and SIP are text based protocols with similar ABNF syntax.

Appendix A contains the collection of strings that RTSP contributed to the static dictionary. The appendix includes references to the documents that define those strings.

Appendix B contains the collection of strings that SDP contributed to the static dictionary. These strings are directly borrowed from RFC 3485 which defines the SDP tokens along with their respective priorities.

While these appendices are of an informative nature, Section 3 gives the normative binary form of the RTSP/SDP dictionary. This is the dictionary to be included in the SigComp implementation. This dictionary has been formed from the collection of individual dictionaries given in appendices A and B.

The following paragraph describes the meaning of different columns in the table. This description is directly copied from RFC 3485.

The columns in the tables are described as follows:

String: represents the UTF-8 string that is inserted into the dictionary. Note that the quotes (") are not part of the string itself. Note also that the notation [CRLF] represents a Carriage Return character (ASCII code 0x0D) followed by a Line Feed character (ASCII code 0x0A).

Pr: indicates the priority of this string within the dictionary. Some compression algorithms, such as DEFLATE, offer an increased efficiency when the most commonly used strings are located at the bottom of the dictionary. To facilitate generating a dictionary that has the most frequently occurring strings further down at the bottom, we have decided to allocate a priority to each string in the dictionary. Priorities range from 1 until 5. A low number in the priority column (e.g., 1) indicates that we believe in a high probability of finding the string in RTSP or SDP messages. A high number in the priority column (e.g., 5) indicates lower probability of finding the string in a RTSP or SDP message. This is typically the
case for less frequent error codes or optional infrequent tags.

Off: indicates the hexadecimal offset of the entry with respect to the first octet in the dictionary. Note that several strings in the collections can share space in the dictionary if they exhibit suitable common substrings.

Len: the length of the string (in octets, in hexadecimal).

References: contains one or more references to the specification and the section within the specification where the string is defined.

Note that the strings stored in the dictionary are case sensitive. (Again, the strings do not comprise the quotes (”), they are just shown here to increase the readability.) Where the string is a header field, we also included the colon ":" and the amount of white space expected to occur. Note that this means that not all messages that conform to the RTSP Augmented BNF, which allows other combinations (e.g., a white space or horizontal tabulator before the

colon (":") sign), will benefit as much from the dictionary -- the best increase in compression performance is to be expected for messages that use the recommended formatting guidelines for RTSP.

Some strings appear followed by an equal sign and some others do not. This depends on whether the string is part of a parameter name or a parameter value.

3. Binary representation of the RTSP/SDP dictionary

This section contains the result of combining the RTSP and the SDP dictionaries described in appendices A and B in order to create a single dictionary that is loaded into SigComp as a state.

The binary SigComp dictionary is comprised of two parts, the concatenation of which serves as the state value of the state item: A string subset, which contains all strings in the contributing collections as a substring (roughly ordered such that strings with low priority numbers occur at the end), and a table subset, which contains pairs of length and offset values for all the strings in the contributing collections. In each of these pairs, the length is stored as a one-byte value, and the offset is stored as a two-byte value that has had 1024 added to the offset (this allows direct referencing from the stored value if the dictionary state has been loaded at address 1024).

If only a subset of the dictionary up to a specific priority is desired,

Priorities desired	String offset	String length	Table offset	Table length
1 only	0x0A03	0x00FC	0x0AFF	0x0054
1..2	0x084D	0x02B2	0x0AFF	0x00F3
1..3	0x05FF	0x0500	0x0AFF	0x01B0
1..4	0x02E5	0x081A	0x0AFF	0x02A0
1..5	0x0000	0x0AFF	0x0AFF	0x036F

Name:	Value:
state_identifier	0xd6edd8a3d5fc8d0c56b09329455877e6bb6ce332
state_length	0x0E62
state_address	0 (not relevant for the dictionary)
state_instruction	0 (not relevant for the dictionary)
minimum_access_length	6
state_value	Representation of the table below.

```
0000 0d0a 613d 0d0a 633d 0d0a 6b3d 0d0a 6d3d    ..a=..c=..k=..m=
0010 3330 3320 5365 6520 4f74 6865 7233 3034    303 See Other304
0020 204e 6f74 204d 6f64 6966 6965 6433 3035     Not Modified305
0030 2055 7365 2050 726f 7879 3430 3220 5061     Use Proxy402 Pa
0040 796d 656e 7420 5265 7175 6972 6564 3430    yment Required40
0050 3320 466f 7262 6964 6465 6e34 3034 204e    3 Forbidden404 N
0060 6f74 2046 6f75 6e64 3430 3520 4d65 7468    ot Found405 Meth
0070 6f64 204e 6f74 2041 6c6c 6f77 6564 3430    od Not Allowed40
0080 3620 4e6f 7420 4163 6365 7074 6162 6c65    6 Not Acceptable
0090 3430 3720 5072 6f78 7920 4175 7468 656e    407 Proxy Authen
00A0 7469 6361 7469 6f6e 2052 6571 7569 7265    tication Require
00B0 6434 3038 2052 6571 7565 7374 2054 696d    d408 Request Tim
00C0 652d 6f75 7434 3130 2047 6f6e 6534 3131    e-out410 Gone411
00D0 204c 656e 6774 6820 5265 7175 6972 6564     Length Required
00E0 3431 3220 5072 6563 6f6e 6469 7469 6f6e    412 Precondition
00F0 2046 6169 6c65 6434 3133 2052 6571 7565     Failed413 Reque
0100 7374 2045 6e74 6974 7920 546f 6f20 4c61    st Entity Too La
0110 7267 6534 3134 2052 6571 7565 7374 2d55    rge414 Request-U
0120 5249 2054 6f6f 204c 6172 6765 3431 3520    RI Too Large415
0130 556e 7375 7070 6f72 7465 6420 4d65 6469    Unsupported Medi
0140 6120 5479 7065 3435 3120 5061 7261 6d65    a Type451 Parame
0150 7465 7220 4e6f 7420 556e 6465 7273 746f    ter Not Understo
0160 6f64 3435 3220 436f 6e66 6572 656e 6365    od452 Conference
0170 204e 6f74 2046 6f75 6e64 3435 3320 4e6f     Not Found453 No
0180 7420 456e 6f75 6768 2042 616e 6477 6964    t Enough Bandwid
0190 7468 3435 3420 5365 7373 696f 6e20 4e6f    th454 Session No
01A0 7420 466f 756e 6434 3535 204d 6574 686f    t Found455 Metho
01B0 6420 4e6f 7420 5661 6c69 6420 696e 2054    d Not Valid in T
01C0 6869 7320 5374 6174 6534 3536 2048 6561    his State456 Hea
01D0 6465 7220 4669 656c 6420 4e6f 7420 5661    der Field Not Va
01E0 6c69 6420 666f 7220 5265 736f 7572 6365    lid for Resource
01F0 3435 3720 496e 7661 6c69 6420 5261 6e67    457 Invalid Rang
0200 6534 3538 2050 6172 616d 6574 6572 2049    e458 Parameter I
0210 7320 5265 6164 2d4f 6e6c 7934 3539 2041    s Read-Only459 A
0220 6767 7265 6761 7465 206f 7065 7261 7469    ggregate operati
0230 6f6e 206e 6f74 2061 6c6c 6f77 6564 3436    on not allowed46
0240 3020 4f6e 6c79 2061 6767 7265 6761 7465    0 Only aggregate
0250 206f 7065 7261 7469 6f6e 2061 6c6c 6f77     operation allow
0260 6564 3530 3120 4e6f 7420 496d 706c 656d    ed501 Not Implem
0270 656e 7465 6435 3032 2042 6164 2047 6174    ented502 Bad Gat
0280 6577 6179 3530 3320 5365 7276 6963 6520    eway503 Service
0290 556e 6176 6169 6c61 626c 6535 3034 2047    Unavailable504 G
02A0 6174 6577 6179 2054 696d 652d 6f75 7435    ateway Time-out5
02B0 3035 2052 5453 5020 5665 7273 696f 6e20    05 RTSP Version
02C0 6e6f 7420 7375 7070 6f72 7465 6435 3531    not supported551
02D0 204f 7074 696f 6e20 6e6f 7420 7375 7070     Option not supp
02E0 6f72 7465 640d 0a69 3d0d 0a75 3d0d 0a65    orted..i=..u=..e
02F0 3d0d 0a72 3d0d 0a7a 3d0d 0a6b 3d63 6c65    =..r=..z=..k=cle
```

```
0300 6172 3a0d 0a6b 3d62 6173 6536 343a 0d0a    ar:..k=base64:..
0310 6b3d 7572 693a 0d0a 6b3d 7072 6f6d 7074    k=uri:..k=prompt
0320 3a0d 0a61 3d63 6174 3a0d 0a61 3d6b 6579    :..a=cat:..a=key
0330 7764 733a 0d0a 613d 746f 6f6c 3a0d 0a61    wds:..a=tool:..a
0340 3d70 7469 6d65 3a0d 0a61 3d6d 6178 7074    =ptime:..a=maxpt
0350 696d 653a 0d0a 613d 6f72 6965 6e74 3a70    ime:..a=orient:p
0360 6f72 7472 6169 740d 0a61 3d6f 7269 656e    ortrait..a=orien
0370 743a 6c61 6e64 7363 6170 650d 0a61 3d6f    t:landscape..a=o
0380 7269 656e 743a 7365 6173 6361 7065 0d0a    rient:seascape..
0390 613d 7479 7065 3a62 726f 6164 6361 7374    a=type:broadcast
03A0 0d0a 613d 7479 7065 3a6d 6565 7469 6e67    ..a=type:meeting
03B0 0d0a 613d 7479 7065 3a6d 6f64 6572 6174    ..a=type:moderat
03C0 6564 0d0a 613d 7479 7065 3a74 6573 740d    ed..a=type:test.
03D0 0a61 3d74 7970 653a 482e 3333 320d 0a61    .a=type:H.332..a
03E0 3d74 7970 653a 7265 6376 6f6e 6c79 0d0a    =type:recvonly..
03F0 613d 6368 6172 7365 743a 0d0a 613d 7364    a=charset:..a=sd
0400 706c 616e 673a 0d0a 613d 6c61 6e67 3a0d    plang:..a=lang:.
0410 0a61 3d66 7261 6d65 7261 7465 3a0d 0a61    .a=framerate:..a
0420 3d71 7561 6c69 7479 3a0d 0a61 3d6d 6964    =quality:..a=mid
0430 3a0d 0a61 3d67 726f 7570 3a0d 0a61 3d6b    :..a=group:..a=k
0440 6579 2d6d 676d 743a 6d69 6b65 790d 0a61    ey-mgmt:mikey..a
0450 3d6b 6579 2d6d 676d 743a 0d0a 6d3d 6170    =key-mgmt:..m=ap
0460 706c 6963 6174 696f 6e20 0d0a 6d3d 6461    plication ..m=da
0470 7461 200d 0a6d 3d63 6f6e 7472 6f6c 2075    ta ..m=control u
0480 6470 6c69 302e 302e 302e 3066 6169 6c75    dpli0.0.0.0failu
0490 7265 756e 6b6e 6f77 6e6f 6374 6574 2d61    reunknownoctet-a
04A0 6c69 676e 6163 6b6f 6374 6574 2d61 6c69    lignackoctet-ali
04B0 676e 3d6d 6f64 652d 7365 743d 6d6f 6465    gn=mode-set=mode
04C0 2d63 6861 6e67 652d 7065 7269 6f64 3d6d    -change-period=m
04D0 6f64 652d 6368 616e 6765 2d6e 6569 6768    ode-change-neigh
04E0 626f 723d 6372 633d 726f 6275 7374 2d73    bor=crc=robust-s
04F0 6f72 7469 6e67 3d72 7073 696e 7465 726c    orting=rpsinterl
0500 6561 7669 6e67 3d63 6861 6e6e 656c 733d    eaving=channels=
0510 7474 722d 696e 7465 6c65 7068 6f6e 652d    ttr-intelephone-
0520 6576 656e 746f 6e65 7665 6e74 736c 6972    eventoneventslir
0530 6174 6572 7463 702d 6662 6170 7032 3530    atertcp-fbapp250
0540 204c 6f77 206f 6e20 5374 6f72 6167 6520     Low on Storage
0550 5370 6163 6533 3030 204d 756c 7469 706c    Space300 Multipl
0560 6520 4368 6f69 6365 7333 3031 204d 6f76    e Choices301 Mov
0570 6564 2050 6572 6d61 6e65 6e74 6c79 3330    ed Permanently30
0580 3220 4d6f 7665 6420 5465 6d70 6f72 6172    2 Moved Temporar
0590 696c 7934 3030 2042 6164 2052 6571 7565    ily400 Bad Reque
05A0 7374 3436 3120 556e 7375 7070 6f72 7465    st461 Unsupporte
05B0 6420 7472 616e 7370 6f72 7434 3632 2044    d transport462 D
05C0 6573 7469 6e61 7469 6f6e 2075 6e72 6561    estination unrea
05D0 6368 6162 6c65 3530 3020 496e 7465 726e    chable500 Intern
05E0 616c 2053 6572 7665 7220 4572 726f 7234    al Server Error4
05F0 3031 2055 6e61 7574 686f 7269 7a65 640d    01 Unauthorized.
0600 0a63 3d49 4e20 4950 3420 0d0a 623d 0d0a    .c=IN IP4 ..b=..
```

```
0610 613d 7265 6376 6f6e 6c79 0d0a 613d 7365    a=recvonly..a=se
0620 6e64 7265 6376 0d0a 613d 7365 6e64 6f6e    ndrecv..a=sendon
0630 6c79 0d0a 613d 696e 6163 7469 7665 4153    ly..a=inactiveAS
0640 2043 5420 5254 502f 5341 5650 2052 5450     CT RTP/SAVP RTP
0650 2f41 5650 4620 736d 7074 652d 3330 2d64    /AVPF smpte-30-d
0660 726f 7073 6d70 7465 2d32 356e 6f77 0d0a    ropsmpte-25now..
0670 5573 6572 2d41 6765 6e74 3a20 0d0a 5757    User-Agent: ..WW
0680 572d 4175 7468 656e 7469 6361 7465 3a20    W-Authenticate:
0690 0d0a 4163 6365 7074 2d4c 616e 6775 6167    ..Accept-Languag
06A0 653a 200d 0a41 7574 686f 7269 7a61 7469    e: ..Authorizati
06B0 6f6e 3a20 0d0a 4261 6e64 7769 6474 683a    on: ..Bandwidth:
06C0 200d 0a43 6f6e 6e65 6374 696f 6e3a 200d     ..Connection: .
06D0 0a43 6f6e 7465 6e74 2d62 6173 653a 200d    .Content-base: .
06E0 0a50 7562 6c69 633a 200d 0a4c 6173 742d    .Public: ..Last-
06F0 4d6f 6469 6669 6564 3a20 0d0a 4966 2d4d    Modified: ..If-M
0700 6174 6368 3a20 0d0a 4966 2d4d 6f64 6966    atch: ..If-Modif
0710 6965 642d 5369 6e63 653a 200d 0a49 662d    ied-Since: ..If-
0720 556e 6d6f 6469 6669 6564 2d53 696e 6365    Unmodified-Since
0730 3a20 0d0a 4c6f 6361 7469 6f6e 3a20 0d0a    : ..Location: ..
0740 5072 6f78 792d 4175 7468 656e 7469 6361    Proxy-Authentica
0750 7465 3a20 0d0a 5261 6e67 653a 200d 0a41    te: ..Range: ..A
0760 6363 6570 742d 456e 636f 6469 6e67 3a20    ccept-Encoding:
0770 0d0a 5265 6665 7265 723a 200d 0a52 6574    ..Referer: ..Ret
0780 7279 2d41 6674 6572 3a20 0d0a 5254 502d    ry-After: ..RTP-
0790 496e 666f 3a20 0d0a 5363 616c 653a 200d    Info: ..Scale: .
07A0 0a53 6572 7665 723a 2063 6f6d 7072 6573    .Server: compres
07B0 7367 7a69 706e 6f2d 6361 6368 656d 696e    sgzipno-cachemin
07C0 2d66 7265 7368 6f6e 6c79 2d69 662d 6361    -freshonly-if-ca
07D0 6368 6564 7072 6976 6174 656e 6f2d 6361    chedprivateno-ca
07E0 6368 656e 6f2d 7472 616e 7366 6f72 6d61    cheno-transforma
07F0 782d 7374 616c 656d 7573 742d 7265 7661    x-stalemust-reva
0800 6c69 6461 7465 7072 6f78 792d 7265 7661    lidateproxy-reva
0810 6c69 6461 7465 6d61 782d 6167 653d 7075    lidatemax-age=pu
0820 626c 6963 6c6f 636b 3d3b 7373 7263 3d3b    bliclock=;ssrc=;
0830 6d6f 6465 3d3b 7469 6d65 3d3b 7274 7074    mode=;time=;rtpt
0840 696d 653d 3b74 696d 656f 7574 3d76 3d30    ime=;timeout=v=0
0850 0d0a 6f3d 0d0a 733d 0d0a 733d 200d 0a63    ..o=..s=..s= ..c
0860 3d49 4e20 4950 3620 0d0a 743d 0d0a 743d    =IN IP6 ..t=..t=
0870 3020 300d 0a61 3d72 7470 6d61 703a 0d0a    0 0..a=rtpmap:..
0880 613d 666d 7470 3a0d 0a61 3d63 7572 723a    a=fmtp:..a=curr:
0890 0d0a 613d 6465 733a 0d0a 613d 636f 6e66    ..a=des:..a=conf
08A0 3a0d 0a6d 3d61 7564 696f 200d 0a6d 3d76    :..m=audio ..m=v
08B0 6964 656f 2052 5450 2f41 5650 2071 6f73    ideo RTP/AVP qos
08C0 6d61 6e64 6174 6f72 796f 7074 696f 6e61    mandatoryoptiona
08D0 6c6f 6361 6c72 656d 6f74 656e 6f6e 6532    localremotenone2
08E0 6541 4d52 0d0a 4361 6368 652d 436f 6e74    eAMR..Cache-Cont
08F0 726f 6c3a 200d 0a43 6f6e 7465 6e74 2d4c    rol: ..Content-L
0900 6f63 6174 696f 6e3a 200d 0a44 6174 653a    ocation: ..Date:
0910 200d 0a45 7870 6972 6573 3a20 0d0a 4672     ..Expires: ..Fr
```

```
0920 6f6d 3a20 0d0a 5370 6565 643a 200d 0a53    om: ..Speed: ..S
0930 6573 7369 6f6e 3a20 0d0a 5469 6d65 7374    ession: ..Timest
0940 616d 703a 200d 0a54 7261 6e73 706f 7274    amp: ..Transport
0950 3a20 0d0a 4163 6365 7074 3a20 2a2f 2a3b    : ..Accept: */*;
0960 713d 6170 706c 6963 6174 696f 6e2f 7364    q=application/sd
0970 7061 7070 6c69 6361 7469 6f6e 2f72 7473    papplication/rts
0980 6c52 5450 4156 5054 4350 5544 5075 6e69    lRTPAVPTCPUDPuni
0990 6361 7374 6d75 6c74 6963 6173 743b 6465    castmulticast;de
09A0 7374 696e 6174 696f 6e3d 3b69 6e74 6572    stination=;inter
09B0 6c65 6176 6564 3d3b 6170 7065 6e64 3b6c    leaved=;append;l
09C0 6179 6572 733d 3b70 6f72 743d 3b63 6c69    ayers=;port=;cli
09D0 656e 742d 706f 7274 3d3b 7365 7276 6572    ent-port=;server
09E0 2d70 6f72 743d 3130 3020 436f 6e74 696e    -port=100 Contin
09F0 7565 3230 3020 4f4b 3230 3120 4372 6561    ue200 OK201 Crea
0A00 7465 640d 0a43 6f6e 7465 6e74 2d54 7970    ted..Content-Typ
0A10 653a 200d 0a43 6f6e 7465 6e74 2d4c 656e    e: ..Content-Len
0A20 6774 683a 200d 0a43 6f6e 7465 6e74 2d4c    gth: ..Content-L
0A30 616e 6775 6167 653a 200d 0a43 6f6e 7465    anguage: ..Conte
0A40 6e74 2d45 6e63 6f64 696e 673a 200d 0a43    nt-Encoding: ..C
0A50 6f6e 6665 7265 6e63 653a 200d 0a41 6c6c    onference: ..All
0A60 6f77 3a20 0d0a 5669 613a 200d 0a56 6172    ow: ..Via: ..Var
0A70 793a 200d 0a43 5365 713a 2074 6578 742f    y: ..CSeq: text/
0A80 7061 7261 6d65 7465 7273 7274 7370 7574    parametersrtsput
0A90 746c 3d75 726c 3d3b 7365 713d 5254 5350    tl=url=;seq=RTSP
0AA0 2f72 7473 703a 2f2f 7274 7370 753a 2f2f    /rtsp://rtspu://
0AB0 414e 4e4f 554e 4345 4745 545f 5041 5241    ANNOUNCEGET_PARA
0AC0 4d45 5445 5245 434f 5244 4553 4352 4942    METERECORDESCRIB
0AD0 454f 5054 494f 4e53 4554 5550 4155 5345    EOPTIONSETUPAUSE
0AE0 5345 545f 5041 5241 4d45 5445 5245 4449    SET_PARAMETEREDI
0AF0 5245 4354 4541 5244 4f57 4e50 4c41 5904    RECTEARDOWNPLAY.
0B00 0e8f 040e 9305 0e97 050e 9c07 0ea1 080e    ................
0B10 a808 0ec9 080e b00d 0eb8 070e d105 0edb    ................
0B20 040e fb06 0ec4 080e ec05 0ed7 0d0e e008    ................
0B30 0ef3 050e 8a0f 0e7b 080e 7308 0e6b 070e    ..........s..k..
0B40 6409 0e5b 0e0e 4d14 0e39 140e 2512 0e13    d.....M..9......
0B50 100e 0304 0de6 0c0d e604 0df2 060d f204    ................
0B60 0df8 0b0d f811 0ce4 140c f508 0d09 0b0d    ................
0B70 1108 0d1c 090d 240b 0d2d 0d0d 380d 0d45    ................
0B80 0a0d 5203 0d5c 030d 5f0b 0d62 0f0d 6210    ................
0B90 0d71 040d 7d03 0d6e 030c b503 0cb9 030d    ................
0BA0 8703 0d8a 070d 8d09 0d94 0d0d 9d0d 0daa    ................
0BB0 070d b708 0dbe 060d c60d 0dcc 0d0d d907    ................
0BC0 0c4d 040c 5405 0c58 0b0c 5d04 0c68 070c    .M..T..X..]..h..
0BD0 6c0b 0c73 090c 7e09 0c87 080c 9009 0c98    l..s............
0BE0 0a0c a10a 0cab 080c b503 0cbd 090c c008    ................
0BF0 0cc9 040c db03 0cde 050c d006 0cd5 030c    ................
0C00 e105 0a56 0d0a 5608 0a63 030a 6b06 0c23    ...V..V..c..k...
0C10 0e0a 6e14 0a7c 130a 9011 0aa3 0d0a b40e    ..n..|..É.......
0C20 0ac1 100a cf0a 0adf 110a e90c 0afa 150b    ................
```

```
0C30 0617 0b1b 0c0b 3216 0b3e 090b 5413 0b5d    ............T...
0C40 0b0b 700f 0b7b 0c0b 8a09 0b96 0a0b 9f06    ..p............
0C50 0c29 060c 2f04 0a1e 040a 1208 0a1e 080b    ................
0C60 a904 0bb1 080b b509 0bee 090b bd0e 0bc6    ................
0C70 060c 1e07 0bd4 080b b50c 0be3 0f0b f710    ................
0C80 0c06 080c 1606 0c35 090c 3b09 0c44 0b09    .......5.....D..
0C90 ff04 0a0a 0c0a 0e0c 0a1a 0c0a 260c 0a32    ................
0CA0 030a 3e03 0a41 090a 4409 0a4d 0409 3d04    .....A..D..M....
0CB0 0955 0409 6904 097e 0409 a204 09bb 0409    .U..i...........
0CC0 d604 0993 0409 ef18 093d 1409 5515 0969    ............U..i
0CD0 1509 7e0f 0993 1009 ef19 09a2 1b09 bb19    ................
0CE0 09d6 0406 e504 06e9 0406 ed04 06f1 0406    ................
0CF0 f50a 06f9 0b07 0308 070e 0b07 1608 0721    ................
0D00 0b07 2909 0734 0a07 3d0d 0747 1307 5414    .....4..=..G..T.
0D10 0767 1307 7b12 078e 1007 a012 07b0 0d07    .g..............
0D20 c20e 07cf 1107 dd0c 07ee 0c07 fa09 0806    ................
0D30 0e08 0f0c 081d 0808 290a 0831 1208 3b0d    ................
0D40 083b 1008 5a09 086a 0c08 7303 087f 0708    ....Z..j..s.....
0D50 8407 088b 0708 920c 08a7 0908 b313 08bc    ................
0D60 1508 cf04 08e4 0f08 e80d 08fa 0909 070b    ................
0D70 0899 0f09 1606 0927 0407 bd04 0924 0709    ................
0D80 3303 08a4 0408 a307 0910 0308 5e04 08f7    3...............
0D90 0308 6003 092c 0404 1004 041d 0404 2d04    ................
0DA0 043a 0404 4e04 045b 0404 6804 047e 0404    ....N.....h.....
0DB0 9004 04b1 0404 c504 04cd 0404 e004 04f7    ................
0DC0 0405 1304 052c 0405 4604 0562 0405 7a04    ........F..b..z.
0DD0 0592 0405 a704 05c9 0405 f004 0601 0406    ................
0DE0 1b04 063e 0406 6204 0675 0406 8404 069b    ......b..u..ä...
0DF0 0406 af04 06cd 0d04 1010 041d 0d04 2d14    ................
0E00 043a 0d04 4e0d 045b 1604 6812 047e 2104    ....N..[..h.....
0E10 9014 04b1 0804 c513 04cd 1704 e01c 04f7    ................
0E20 1905 131a 052c 1c05 4618 0562 1805 7a15    ........F..b..z.
0E30 0592 2205 a727 05c9 1105 f01a 0601 2306    ................
0E40 1b24 063e 1306 620f 0675 1706 8414 069b    ......b..u......
0E50 1e06 af18 06cd 0404 0004 0404 0404 0804    ................
0E60 040c                                       ...
```

Table 1: binary representation of the static RTSP/SDP dictionary for SigComp

4. Security Considerations

This memo does not introduce any known additional security risk.

5. IANA Considerations

None.

6. Acknowledgements

We would like to thank the authors of RFC 3485 for providing the basic framework for creating a static dictionary.

7. For Further Work

Exploring the possibilty of having a combined dictionary for HTTP/SIP/SDP/RTSP. This involves developing a dictionary with common keywords used by HTTP/SIP/RTSP as a base and ability to upgrade this for extensions. The dictionary must be organized in such a way as to allow partial loading of only the components required for the application in use.

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Appendix A. RTSP input strings to the RTSP/SDP static dictionary

For reference, this section lists the RTSP input strings that were used in generating the dictionary, as well as a priority value, the offset of the string in the generated dictionary, the length of the string, and one or more references into the referenced documents that motivate the presence of this string. Note that the notation "[CRLF]" stands for a sequence of two bytes with the values 0x0d and 0x0a, respectively.

The priority value is used for determining the position of the string in the dictionary. Lower priority values (higher priorities) cause

the string to occur at a later position in the dictionary, making it more efficient to reference the string in certain compression algorithms. Hence, lower priority values were assigned to strings more likely to occur.

String	Pr	Off	Len	References
"ttl="	1	0004	0e8f	[1] 12.39
"url="	1	0004	0e93	[1] 12.33
";seq="	1	0005	0e97	[1] 12.33
"RTSP/"	1	0005	0e9c	[1] 6.1
"rtsp://"	1	0007	0ea1	[1] 3.2
"rtspu://"	1	0008	0ea8	[1] 3.2
"DESCRIBE"	1	0008	0ec9	[1] 10.2
"ANNOUNCE"	1	0008	0eb0	[1] 10.3
"GET_PARAMETER"	1	000d	0eb8	[4] 10.8
"OPTIONS"	1	0007	0ed1	[1] 10.1
"PAUSE"	1	0005	0edb	[1] 10.6
"PLAY"	1	0004	0efb	[1] 10.5
"RECORD"	1	0006	0ec4	[1] 10.11
"REDIRECT"	1	0008	0eec	[1] 10.10
"SETUP"	1	0005	0ed7	[1] 10.4
"SET_PARAMETER"	1	000d	0ee0	[1] 10.9
"TEARDOWN"	1	0008	0ef3	[1] 10.7
"rtspu"	1	0005	0e8a	[1] 3.2
"text/parameters"	1	000f	0e7b	[1] 10.8
"[CRLF]CSeq: "	1	0008	0e73	[2] 12.17
"[CRLF]Vary: "	1	0008	0e6b	[1] 12.42
"[CRLF]Via: "	1	0007	0e64	[1] 12.43
"[CRLF]Allow: "	1	0009	0e5b	[1] 12.4
"[CRLF]Conference: "	1	000e	0e4d	[1] 12.9
"[CRLF]Content-Encoding: "	1	0014	0e39	[1] 12.12
"[CRLF]Content-Language: "	1	0014	0e25	[1] 12.13
"[CRLF]Content-Length: "	1	0012	0e13	[1] 12.14
"[CRLF]Content-Type: "	1	0010	0e03	[1] 12.16
"100 "	2	0004	0de6	[1] 7.1.1
"100 Continue"	2	000c	0de6	[1] 7.1.1
"200 "	2	0004	0df2	[1] 7.1.1
"200 OK"	2	0006	0df2	[1] 7.1.1
"201 "	2	0004	0df8	[1] 7.1.1
"201 Created"	2	000b	0df8	[1] 7.1.1
"[CRLF]Cache-Control: "	2	0011	0ce4	[1] 12.8
"[CRLF]Content-Location: "	2	0014	0cf5	[1] 12.15
"[CRLF]Date: "	2	0008	0d09	[1] 12.18
"[CRLF]Expires: "	2	000b	0d11	[1] 12.19
"[CRLF]From: "	2	0008	0d1c	[1] 12.20
"[CRLF]Speed: "	2	0009	0d24	[1] 12.35
"[CRLF]Session: "	2	000b	0d2d	[1] 12.37

"[CRLF]Timestamp: "	2	000d	0d38	[1]	12.38
"[CRLF]Transport: "	2	000d	0d45	[1]	12.39
"[CRLF]Accept: "	2	000a	0d52	[1]	12.1
"*/*"	2	0003	0d5c	[2]	14.1
";q="	2	0003	0d5f	[2]	14.1
"application"	2	000b	0d62	[1]	12.1
"application/sdp"	2	000f	0d62	[1]	12.1
"application/rtsl"	2	0010	0d71	[1]	12.1
"rtsl"	2	0004	0d7d		
"sdp"	2	0003	0d6e		
"RTP"	2	0003	0cb5	[1]	12.39
"AVP"	2	0003	0cb9	[1]	12.39
"TCP"	2	0003	0d87	[1]	12.39
"UDP"	2	0003	0d8a	[1]	12.39
"unicast"	2	0007	0d8d	[1]	12.39
"multicast"	2	0009	0d94	[1]	12.39
";destination="	2	000d	0d9d	[1]	12.39
";interleaved="	2	000d	0daa	[1]	12.39
";append"	2	0007	0db7	[1]	12.39
";layers="	2	0008	0dbe	[1]	12.39
";port="	2	0006	0dc6	[1]	12.39
";client-port="	2	000d	0dcc	[1]	12.39
";server-port="	2	000d	0dd9	[1]	12.39
"smpte"	3	0005	0a56	[1]	3.5
"smpte-30-drop"	3	000d	0a56	[1]	3.5
"smpte-25"	3	0008	0a63	[1]	3.5
"now"	3	0003	0a6b	[1]	3.6
"clock="	3	0006	0c23	[1]	3.7
"[CRLF]User-Agent: "	3	000e	0a6e	[1]	12.41
"[CRLF]WWW-Authenticate: "	3	0014	0a7c	[1]	12.44
"[CRLF]Accept-Language: "	3	0013	0a90	[1]	12.3
"[CRLF]Authorization: "	3	0011	0aa3	[1]	12.5
"[CRLF]Bandwidth: "	3	000d	0ab4	[1]	12.6
"[CRLF]Connection: "	3	000e	0ac1	[1]	12.10
"[CRLF]Content-base: "	3	0010	0acf	[1]	12.11
"[CRLF]Public: "	3	000a	0adf	[1]	12.28
"[CRLF]Last-Modified: "	3	0011	0ae9	[1]	12.24
"[CRLF]If-Match: "	3	000c	0afa	[1]	12.22
"[CRLF]If-Modified-Since: "	3	0015	0b06	[1]	12.23
"[CRLF]If-Unmodified-Since: "	3	0017	0b1b	[1]	12.23
"[CRLF]Location: "	3	000c	0b32	[1]	12.25
"[CRLF]Proxy-Authenticate: "	3	0016	0b3e	[1]	12.26
"[CRLF]Range: "	3	0009	0b54	[1]	12.29
"[CRLF]Accept-Encoding: "	3	0013	0b5d	[1]	12.2
"[CRLF]Referer: "	3	000b	0b70	[1]	12.30
"[CRLF]Retry-After: "	3	000f	0b7b	[1]	12.31
"[CRLF]RTP-Info: "	3	000c	0b8a	[1]	12.33
"[CRLF]Scale: "	3	0009	0b96	[1]	12.34
"[CRLF]Server: "	3	000a	0b9f	[1]	12.36

";ssrc="	3	0006	0c29	[1]	12.39
";mode="	3	0006	0c2f	[1]	12.39
"compress"	3	0008	0ba9	[2]	14.3
"gzip"	3	0004	0bb1	[2]	14.3
"no-cache"	3	0008	0bb5	[1]	12.8
"max-stale"	3	0009	0bee	[1]	12.8
"min-fresh"	3	0009	0bbd	[1]	12.8
"only-if-cached"	3	000e	0bc6	[1]	12.8
"public"	3	0006	0c1e	[1]	12.8
"private"	3	0007	0bd4	[1]	12.8
"no-cache"	3	0008	0bb5	[1]	12.8
"no-transform"	3	000c	0be3	[1]	12.8
"must-revalidate"	3	000f	0bf7	[1]	12.8
"proxy-revalidate"	3	0010	0c06	[1]	12.8
"max-age="	3	0008	0c16	[1]	13.2.4
";time="	3	0006	0c35	[1]	12.29
";rtptime="	3	0009	0c3b	[1]	12.33
";timeout="	3	0009	0c44	[1]	12.37
"250 "	4	0004	093d	[1]	7.1.1
"300 "	4	0004	0955	[1]	7.1.1
"301 "	4	0004	0969	[1]	7.1.1
"302 "	4	0004	097e	[1]	7.1.1
"461 "	4	0004	09a2	[1]	7.1.1
"462 "	4	0004	09bb	[1]	7.1.1
"500 "	4	0004	09d6	[1]	7.1.1
"400 "	4	0004	0993	[1]	7.1.1
"401 "	4	0004	09ef	[1]	7.1.1
"250 Low on Storage Space"	4	0018	093d	[1]	7.1.1
"300 Multiple Choices"	4	0014	0955	[1]	7.1.1
"301 Moved Permanently"	4	0015	0969	[1]	7.1.1
"302 Moved Temporarily"	4	0015	097e	[1]	7.1.1
"400 Bad Request"	4	000f	0993	[1]	7.1.1
"401 Unauthorized"	4	0010	09ef	[1]	7.1.1
"461 Unsupported transport"	4	0019	09a2	[1]	7.1.1
"462 Destination unreachable"	4	001b	09bb	[1]	7.1.1
"500 Internal Server Error"	4	0019	09d6	[1]	7.1.1
"303 "	5	0004	0410	[1]	7.1.1
"304 "	5	0004	041d	[1]	7.1.1
"305 "	5	0004	042d	[1]	7.1.1
"402 "	5	0004	043a	[1]	7.1.1
"403 "	5	0004	044e	[1]	7.1.1
"404 "	5	0004	045b	[1]	7.1.1
"405 "	5	0004	0468	[1]	7.1.1
"406 "	5	0004	047e	[1]	7.1.1
"407 "	5	0004	0490	[1]	7.1.1
"408 "	5	0004	04b1	[1]	7.1.1
"410 "	5	0004	04c5	[1]	7.1.1
"411 "	5	0004	04cd	[1]	7.1.1

"412 "	5	0004	04e0	[1]	7.1.1
"413 "	5	0004	04f7	[1]	7.1.1
"414 "	5	0004	0513	[1]	7.1.1
"415 "	5	0004	052c	[1]	7.1.1
"451 "	5	0004	0546	[1]	7.1.1
"452 "	5	0004	0562	[1]	7.1.1
"453 "	5	0004	057a	[1]	7.1.1
"454 "	5	0004	0592	[1]	7.1.1
"455 "	5	0004	05a7	[1]	7.1.1
"456 "	5	0004	05c9	[1]	7.1.1
"457 "	5	0004	05f0	[1]	7.1.1
"458 "	5	0004	0601	[1]	7.1.1
"459 "	5	0004	061b	[1]	7.1.1
"460 "	5	0004	063e	[1]	7.1.1
"501 "	5	0004	0662	[1]	7.1.1
"502 "	5	0004	0675	[1]	7.1.1
"503 "	5	0004	0684	[1]	7.1.1
"504 "	5	0004	069b	[1]	7.1.1
"505 "	5	0004	06af	[1]	7.1.1
"551 "	5	0004	06cd	[1]	7.1.1
"303 See Other"	5	000d	0410	[1]	7.1.1
"304 Not Modified"	5	0010	041d	[1]	7.1.1
"305 Use Proxy"	5	000d	042d	[1]	7.1.1
"402 Payment Required"	5	0014	043a	[1]	7.1.1
"403 Forbidden"	5	000d	044e	[1]	7.1.1
"404 Not Found"	5	000d	045b	[1]	7.1.1
"405 Method Not Allowed"	5	0016	0468	[1]	7.1.1
"406 Not Acceptable"	5	0012	047e	[1]	7.1.1
"407 Proxy Authentication Required"	5	0021	0490	[1]	7.1.1
"408 Request Time-out"	5	0014	04b1	[1]	7.1.1
"410 Gone"	5	0008	04c5	[1]	7.1.1
"411 Length Required"	5	0013	04cd	[1]	7.1.1
"412 Precondition Failed"	5	0017	04e0	[1]	7.1.1
"413 Request Entity Too Large"	5	001c	04f7	[1]	7.1.1
"414 Request-URI Too Large"	5	0019	0513	[1]	7.1.1
"415 Unsupported Media Type"	5	001a	052c	[1]	7.1.1
"451 Parameter Not Understood"	5	001c	0546	[1]	7.1.1
"452 Conference Not Found"	5	0018	0562	[1]	7.1.1
"453 Not Enough Bandwidth"	5	0018	057a	[1]	7.1.1
"454 Session Not Found"	5	0015	0592	[1]	7.1.1
"455 Method Not Valid in This State"	5	0022	05a7	[1]	7.1.1
"456 Header Field Not Valid for Resource"	5	0027	05c9	[1]	7.1.1
"457 Invalid Range"	5	0011	05f0	[1]	7.1.1
"458 Parameter Is Read-Only"	5	001a	0601	[1]	7.1.1
"459 Aggregate operation not allowed"	5	0023	061b	[1]	7.1.1
"460 Only aggregate operation allowed"	5	0024	063e	[1]	7.1.1
"501 Not Implemented"	5	0013	0662	[1]	7.1.1
"502 Bad Gateway"	5	000f	0675	[1]	7.1.1
"503 Service Unavailable"	5	0017	0684	[1]	7.1.1

"504 Gateway Time-out"	5	0014	069b	[1]	7.1.1
"505 RTSP Version not supported"	5	001e	06af	[1]	7.1.1
"551 Option not supported"	5	0018	06cd	[1]	7.1.1

Table A.1: RTSP input strings for the RTSP/SDP dictionary

String	Pr	Off	Len	References	
"v=0[CRLF]o="	2	0C4D	0007	[5]	6
"[CRLF]s="	2	0C54	0004	[5]	6
"[CRLF]s= "	2	0C58	0005	[13]	5
"[CRLF]i="	4	06E5	0004	[5]	6
"[CRLF]e="	4	06ED	0004	[5]	6
"[CRLF]c=IN IP4 "	3	09FF	000B	[5]	6
"[CRLF]c=IN IP6 "	2	0C5D	000B	[5]	6
"[CRLF]c="	5	0404	0004	[5]	6
"[CRLF]b="	3	0A0A	0004	[5]	6
"[CRLF]t="	2	0C68	0004	[5]	6
"[CRLF]t=0 0"	2	0C6C	0007	[13]	5
"[CRLF]r="	4	06F1	0004	[5]	6
"[CRLF]k=clear:"	4	06F9	000A	[5]	6
"[CRLF]k=base64:"	4	0703	000B	[5]	6
"[CRLF]k=uri:"	4	070E	0008	[5]	6
"[CRLF]k=prompt:"	4	0716	000B	[5]	6
"[CRLF]k="	5	0408	0004	[5]	6
"[CRLF]u="	4	06e9	0004	[5]	6
"[CRLF]z="	4	06f5	0004	[5]	6
"[CRLF]a=cat:"	4	0721	0008	[5]	6
"[CRLF]a=keywds:"	4	0729	000B	[5]	6
"[CRLF]a=tool:"	4	0734	0009	[5]	6
"[CRLF]a=ptime:"	4	073D	000A	[5]	6
"[CRLF]a=maxptime:"	4	0747	000D	[5]	6
"[CRLF]a=recvonly"	3	0A0E	000C	[5]	6
"[CRLF]a=sendrecv"	3	0A0A	000C	[5]	6
"[CRLF]a=sendonly"	3	0A26	000C	[5]	6
"[CRLF]a=inactive"	3	0A32	000C	[5]	6
"[CRLF]a=orient:portrait"	4	0754	0013	[5]	6
"[CRLF]a=orient:landscape"	4	0767	0014	[5]	6
"[CRLF]a=orient:seascape"	4	077B	0013	[5]	6
"[CRLF]a=type:broadcast"	4	078E	0012	[5]	6
"[CRLF]a=type:meeting"	4	07A0	0010	[5]	6
"[CRLF]a=type:moderated"	4	07B0	0012	[5]	6
"[CRLF]a=type:test"	4	07C2	000D	[5]	6
"[CRLF]a=type:H.332"	4	07CF	000E	[5]	6
"[CRLF]a=type:recvonly"	4	07DD	0011	[5]	6
"[CRLF]a=charset:"	4	07EE	000C	[5]	6
"[CRLF]a=sdplang:"	4	07FA	000C	[5]	6
"[CRLF]a=lang:"	4	0806	0009	[5]	6

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"[CRLF]a=rtpmap:"                       2 000b 0c73 [5]  6
"[CRLF]a=framerate:"                    4 081D 000C [5]  6
"[CRLF]a=fmtp:"                         2 0C7E 0009 [5]  6
"[CRLF]a=curr:"                         2 0C87 0009 [5]  4
"[CRLF]a=des:"                          2 0C90 0008 [5]  4
"[CRLF]a=conf:"                         2 0C98 0009 [6]  4
"[CRLF]a=mid:"                          4 0829 0008 [8]  3
"[CRLF]a=group:"                        4 0831 000A [8]  3
"[CRLF]a=key-mgmt:mikey"                4 083B 0012 [10] 6
"[CRLF]a=key-mgmt:"                     4 083B 000D [10] 6
"[CRLF]a="                              5 0400 0004 [5]  6
"[CRLF]m=audio "                        2 0CA1 000A [5]  6
"[CRLF]m=video "                        2 0CAB 000A [5]  6
"[CRLF]m=application "                  4 085A 0010 [5]  6
"[CRLF]m=data "                         4 086A 0009 [5]  6
"[CRLF]m=control "                      4 0873 000C [5]  6
"[CRLF]a=quality:"                      4 081d 000c [5]  6
"[CRLF]m="                              5 040C 0004 [5]  6
"AS "                                   3 0A3E 0003 [5]  6
"CT "                                   3 0A41 0003 [5]  6
"RTP/AVP "                              2 0CB5 0008 [5]  A
"RTP/SAVP "                             3 0A44 0009 [11][30] 12
"RTP/AVPF "                             3 0A4D 0009 [12] 4.1
"udp"                                   4 087F 0003 [3] 25.1,
                                            [6] A, [3] 25.1, [6] A
"0.0.0.0"                               4 0884 0007 [5]  A
"qos"                                   2 0CBD 0003 [6]  4
"mandatory"                             2 0CC0 0009 [6]  4
"optional"                              2 0CC9 0008 [3] 20.11,
                                            [6]  4, [3] 20.11, [6]  4
"none"                                  2 CDB 0004  [6]  4
"failure"                               4 088B 0007 [6]  4
"unknown"                               4 0892 0007 [6]  4
"e2e"                                   2 0CDE 0003 [6]  4
"local"                                 2 0CD0 0005 [6]  4
"remote"                                2 0CD5 0006 [6]  4
"send"                                  2 0A1E 0004 [6]  4
"recv"                                  2 0A12 0004 [6]  4
"sendrecv"                              2 0A1E 0008 [6]  4
"AMR"                                   2 0CE1 0003 [7]  8
"octet-align="                          4 08A7 000C [7]  8
"mode-set="                             4 08B3 0009 [7]  8
"mode-change-period="                   4 08BC 0013 [7]  8
"mode-change-neighbor="                 4 08CF 0015 [7]  8
"crc="                                  4 08E4 0004 [7]  8
"robust-sorting="                       4 08E8 000F [7]  8
"interleaving="                         4 08FA 000D [7]  8
"channels="                             4 0907 0009 [7]  8
"octet-align"                           4 0899 000B [7]  8
```

"telephone-event"	4 0916 000F	[9]	3.3, 6.1
"events"	4 0927 0006	[9]	6.1
"rate"	4 07BD 0004	[9]	6.1, 6.2
"tone"	4 0924 0004	[9]	6.2
"rtcp-fb"	4 0933 0007	[12]	4
"ack"	4 08A4 0003	[12]	4
"nack"	4 08A3 0004	[12]	4
"ttr-int"	4 0910 0007	[12]	4
"app"	4 085E 0003	[12]	4
"rpsi"	4 08F7 0004	[12]	4
"pli"	4 0860 0003	[12]	4
"sli"	4 092C 0003	[12]	4

Table B.1: SDP input strings for the RTSP/SDP dictionary

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